

VI

THE FORMATION OF OPINION BASED UPON LEGAL EVIDENCE

IN the trial of a case, as you know, the members of the jury and the judge have an opinion to form or, if you prefer, a judgment to reach. They must decide from the evidence presented whether the defendant is guilty or is liable as charged. The evidence is presented serially, one witness following another. Some parts of the testimony are more significant for the final result, some witnesses are more reliable, some more persuasive than others. Presumably every portion of the evidence must, in effect, be sifted, weighed and evaluated as probable or improbable, as strong or weak, as true or false, and as for or against the plea of the defendant. Somehow in the end, if the evidence is conclusive, a judgment is formed with respect to the guilt or to the liability of the defendant.

How is such a judgment reached? How does the human organism function when it forms an opinion based upon evidentiary facts? The answer is not easy to find, and the problem becomes more difficult when we consider that legal procedure expects judgment to be suspended until all the evidence has been presented. By what trick of memory can the members of a jury retain all the bits of evidence, every one with its own evaluation, in a trial that may have lasted for days or even weeks, and then summon them for review and final judgment?

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With the possible exception of Jeremy Bentham, the only jurist who appreciated and faced this problem was John Henry Wigmore, for many years dean of the law school at Northwestern University, and the author of the monumental *Treatise on Evidence*, a book familiar to every law-student in America and in England as well. He not only struggled with the problem, but he also found, as he thought, a solution. In 1913 he presented this solution in a book entitled *The Principles of Judicial Proof*. The book as a whole was in many ways remarkable, and I wish I had the time to pay it the tribute it deserves. The part, however, that concerns us is what Wigmore calls "The chart method of the analysis of mixed masses of evidence." It consists in the determination of the probative value of every evidentiary fact, as it is presented, with respect to the question at issue—not to the final result which would be the proof. These values are expressed in a series of symbols which he invented, and these symbols are then placed in a chart or diagram so that when the chart is finished all of the evidence which had been presented serially is now presented simultaneously. Whereupon the thinker may proceed to find the proof which is in the chart, provided only that the evidence is conclusive.

In so far as I know this method has never received more than academic acceptance. Wigmore felt the failure and in 1931 he published a second edition in which he tried to bring the salient points of the method into bolder relief. Still it failed, and in 1937 a third edition with a slight change in title appeared; and this was the last, for in 1943 his brilliant career came to a tragic end. For more than twenty-five years he had struggled with the problem which he regarded as a serious one, and its solution as essential to a higher order of justice. Why did he fail?

I venture to suggest that the failure lay in his mistaken

understanding of the psychological nature of the thinking processes. His problem was conceived from the point of view of formal logic, and he confused the actual process of thinking with the canons of logic which are applied to the results of our thinking, not to the thinking itself. In other words he supposed that we think in the way that a logical analysis tests the outcome of our thinking, and not as in practice we actually think.

At any rate it was from this consideration that a dozen years ago I began a series of experiments in the hope of discovering, in part at least, just what the individual does when he tries to reach a judgment from evidentiary facts. And it is the results of the first four of these experiments that I propose to present to you today. The exposition is not easy, and I have thought it would save me much trouble and at the same time interest you, if I should take you through the motions of an experiment—allow you to see for yourselves how you reach decisions. Then when we have finished I shall summarize the kind of thinking you have been doing by showing you some results of some actual experiments made elsewhere.

I propose to read to you the report of the evidence in the Thomas Hoag Case—a famous trial for bigamy held in the court of Oyer and Terminer in New York City on June 22, 1804. I have divided the evidence into eleven installments, to which I have added two others—installment I, the indictment, and installment XIII, the verdict reached by the jury in the actual trial. These latter are of course not evidence; but we wanted to see what effect if any they might have upon the judgments.

As I read I shall pause at the end of every installment, and I shall ask you at that point to make your judgment of the relative guilt or innocence of the defendant. You may do this

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in terms of the following nine-point scale: 1, certainty of innocence; 2, strong belief in innocence; 3, fair belief in innocence; 4, slight belief in innocence; 5, doubtful; 6, slight belief in guilt; 7, fair belief in guilt; 8, strong belief in guilt; 9, certainty of guilt. To be more explicit, if at the end of an installment you are certain of guilt your judgment will be 9. If you have a slight belief in guilt, it will be 6, if doubtful, 5. If certain of innocence it will be 1, and so on. If you have pencil and paper, you may find it amusing to record your judgments in order. That is all that I ask you to do. Will you do it?

Your silence seems to indicate your consent. I proceed, therefore, with the report of this amazing case:¹

I. Indictment. The prisoner was indicted for that whereas Thomas Hoag, late of Haverstraw, in the county of Rockland, laborer, otherwise called Joseph Parker, now of the city of New York, cartman, on the 8th of May, 1797, at the said city of New York, was lawfully married to Susan Faesch, and the said Susan then and there had for a wife,² and the said Thomas, alias, etc., afterwards, to wit, on the 25th day of December, 1800, at the county of Rockland, his said wife being then in full life, feloniously did marry, and to wife did take, one Catherine Secor, etc. To this, the prisoner pleaded not guilty. *Judgment.*

II. Prosecution. On the part of the prosecution, Benjamin Coe testified: That he was one of the judges of the court of common pleas in the county of Rockland; that he well knew the prisoner at the bar; that he came to Rockland in the beginning of September, in the year 1800, and there passed by the name of Thomas Hoag; that the prisoner worked for witness' table, during which time he ate daily at witness' table, and he of course saw him daily; that on the 25th day of December, 1800, witness married the prisoner to one Catherine Secor; that witness is confident of the time, because he recollected that on that very day one of his own children was christened; that during all the time the prisoner remained in Rockland county witness saw him continually; he was therefore as much satisfied that the prisoner was Thomas Hoag as that he himself was Benjamin Coe. *Judgment.*

III. Prosecution. John Knapp testified, that he knew the

prisoner in 1800 and 1801; he was then in Rockland county, and passed by the name of Thomas Hoag; that he saw him constantly for five months, during the time the prisoner was at Rockland; that he was at the prisoner's wedding; that Hoag had a scar under his foot; the way that witness knew it, was that he and Hoag were leaping together, and witness outleaped Hoag, upon which the latter remarked that he could not leap as well now as formerly, in consequence of a wound in his foot by treading on a drawing knife; that Hoag then pulled off his shoe and showed witness the scar under his foot, occasioned by that wound; the scar was very perceptible. Witness was confident prisoner at the bar was Thomas Hoag.

Catherine Conklin (formerly Catherine Secor) testified, that she became acquainted with prisoner in the beginning of September, 1800, when he came to Rockland; he then passed by the name of Thomas Hoag; that witness saw him constantly; that prisoner, shortly after their acquaintance, paid his addresses to her, and finally, on the 25th of December, married her; that he lived with her till the latter end of March, 1801, when he left her; that she did not see him again until two years after; that on the morning of his leaving her, he appeared desirous of communicating something to her of importance but was dissuaded from it by a person who was with him and who passed for his brother; that Hoag, until his departure, was a kind, attentive and affectionate husband; that she was as well convinced as she could possibly be of anything in this world, that the prisoner at the bar was the person who married her by the name of Thomas Hoag; that she then thought him and still thinks him the handsomest man she ever saw. *Judgment.*

IV. Defense. Joseph Chadwick, who testified, that he had been acquainted with the prisoner, Joseph Parker, a number of years; that witness resides in this city, is a rigger by trade; that the prisoner worked in the employ of the witness a considerable time as a rigger; that prisoner began to work for witness in September, 1799, and continued to work for him till the spring of 1801; that during that period he saw him constantly; that it appeared from witness' books that Parker received money from witness, for work which he had performed on the following days, viz.: on the 6th of October, and 6th and 13th December, 1800; on the 9th, 16, and 28th February, and 11th March, 1801; that Parker lived from May, 1800, till sometime in April, 1801, in a house in the city of New York belonging to Capt. Pelor; that during that period, and since, witness has been well acquainted with the prisoner. *Judgment.*

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V. Defense. Isaac Ryckman testified, that he was an inhabitant of the city of New York: that he was well acquainted with Joseph Parker, the prisoner at the bar, and had known him a number of years; that witness and Parker were jointly engaged in the latter part of the year 1800, in loading a vessel for Capt. Tredwell, of New York; that they began to work on the 20th day of December, 1800, and were employed the greater part of the month of January, 1801, in the loading of the vessel; that during that time the witness and Parker worked together daily; the witness recollected well that they worked together on the 25th day of December, 1800; he remembered it because he never worked on Christmas day, before or since; he knew it was in the year 1800, because he knew that Parker lived, that year, in a house belonging to Capt. Pelor, and he remembered their borrowing a screw for the purpose of packing cotton into the hold of the vessel they were at work at, from a Mrs. Mitchell, who lived next door to Parker; that witness was one of the city watch, and that Parker was also at that time upon the watch; and that witness had served with him from that time to the present day, upon the watch, and never recollected missing him any time during that period from the city.

Aspinwall Cornwall testified, that he lived in Rutger street, and had lived there a number of years; that he kept a grocery store; that he knew Parker, the prisoner at the bar, in 1800 and 1801; that Parker then lived in Capt. Pelor's house; that he lived only one year in Pelor's house; that Parker, while he lived there, traded with witness; that witness recollected once missing Parker for a week, and, inquiring, found he had been at work on Staten Island, on board one of the United States frigates; that, excepting that time, he never knew him to be absent from his family, but saw him constantly. *Judgment.*

VI. Defense. Elizabeth Mitchell testified, that she knew Parker, the prisoner at the bar, well; that in the years 1800 and 1801 Parker lived in a house adjoining to one in which witness lived; that the house Parker lived in belonged to Capt. Pelor; that witness was in habits of intimacy with Parker's family, and visited them constantly; that Parker being one of the city watch, she used to hear him rap with his stick at the door, to awaken his family, upon his return from the watch in the morning; that she also remembered, perfectly well, Parker's borrowing a screw from her on Christmas day, in 1800; she offered him some spirits to drink, but he preferred wine, which she got for him; the circumstance of her lending the screw to him she was the more positive of, from recollecting, also,

that it was broken by Parker in using it; that Parker never lived more than one year in Capt. Pelor's house, and from that time to the present day, witness had been on the same terms of intimacy with Parker's family; she therefore considered it as almost impossible that Parker could have been absent from town, any time, without her knowing it; and she never knew him to be absent more than one week, while he lived at Pelor's house. *Judgment.*

VII. Defense. James Redding testified, that he had lived in the city a number of years; that he had known Parker, the prisoner at the bar, from his infancy; that Parker was born at Rye, in Westchester county; that Parker, in the year 1800, lived in Capt. Pelor's house; that witness saw him then constantly, and never knew him during that time to be absent from town, during any length of time; that witness particularly remembered that, sometime in the beginning of the month of January, 1801, while Parker lived in Capt. Pelor's house, witness assisted Parker in killing a hog.

Lewis Osborne testified, that he had been acquainted with Parker, the prisoner at the bar, for the last four years; that witness had been one of the city watch: that from June, 1800, to May, 1801, Parker served upon the watch with witness; that, at first, Parker served as a substitute; that witness remembered that Parker, a few days after Christmas, in 1800, was placed upon the roll of the regular watch, in the place of one Ransom, who was taken sick; witness was certain it was in the period above mentioned, because that was the only time witness ever served upon the watch; that during the above period, witness and Parker were stationed together, while on the watch, at the same post; witness was certain that Parker, the prisoner at the bar, was the person with whom he had served upon the watch, and was confident that during that time Parker was never absent from the watch, more than a week, at any one time. *Judgment.*

VIII. Prosecution. Moses Anderson testified, that he had lived at Haverstraw, Rockland county; that he had lived there since the year 1791; that he knew the prisoner at the bar well; that he came to the house of the witness in the beginning of September, 1800; that he then passed by the name of Thomas Hoag; that he worked for the witness eight or ten days; that from that time till the 25th of December, prisoner passed almost every Sunday at witness's house, that during prisoner's stay in Rockland county witness saw him constantly; and if prisoner was the person alluded to, he had a scar on his forehead, which he told witness was occasioned by the kick of a horse; he had also a small mark on his neck (those marks

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the prisoner had); he had also a scar under his foot, between the heel and ball of the foot, occasioned, as he told witness, by treading on a drawing knife; *that that scar was easy to be seen*; that his speech was remarkable, his voice being effeminate; that he spoke quick and lisped a little (these peculiarities were observable in prisoner's speech); that prisoner supped at witness's house on the night of his marriage in December, 1800; that witness had not seen prisoner until this day, since prisoner left Rockland, which was between three and four years ago; that witness was perfectly satisfied in his own mind that prisoner was Thomas Hoag.

Lavina Anderson testified, that she knew prisoner at the bar; his name was Thomas Hoag; that in September, 1800, he came to witness's house in Rockland county, and worked for her husband eight or ten days, then worked for Judge Suffrein; every Saturday night until the prisoner was married, he and a person who passed for his brother, came to witness's house and stayed till Monday morning; that witness washed for him; there was no mark upon his linen; that prisoner, if he is Thomas Hoag, has a scar upon his forehead, and one also under his foot; was certain of the mark under his foot, because she recollected that the person who passed as his brother, having cut himself severely with a scythe, and complaining very much of the pain, Thomas Hoag told him he had been much worse wounded and then showed the scar under his foot. Witness also testified, that about a year ago, after a suit had been brought in the justices' court in New York, wherein the identity of the prisoner's person came in question, witness was in town, and having heard a great deal said on the subject, she was determined to see him and judge for herself; that accordingly she went to prisoner's house, but he was not at home; she then went to the place where she was informed he stood with his cart; that she there saw him lying on his cart with his head on his hand; that in that situation she instantly knew him; that she spoke to him and when he answered she immediately recognized his voice; that it was very singular, shrill, thick, hurried, and something of a lisp; that Hoag had also a habit of shrugging up his shoulders when he spoke, which she also observed in the prisoner; that prisoner said he had been told she was coming to see him, and it was surprising people could be so deceived, and asked witness if she thought he was the man, to which witness replied that she thought he was, but would be more certain if she looked at his forehead; that she accordingly lifted up his hat, and saw the scar upon his forehead, which she had often before seen; that prisoner then told her it was occasioned by the kick of a horse.

Witness added that it was impossible she could be mistaken—prisoner was Thomas Hoag. *Judgment.*

IX. Prosecution. Margaret Secor testified, that about four years ago she lived at Rockland with her father, Moses Anderson; that prisoner at the bar, Thomas Hoag, came to this house in September, 1800; that he remained in Rockland five or six months; that he had a scar on his forehead, that Hoag used to come every Saturday night to her father's to pass Sunday with them; that she used to comb and tie his hair every Sunday, and thus saw the scar; that witness married about two years ago, and came immediately to live in the city of New York; that after she had been in town a fortnight, she was one day standing at her door, when she heard a cartman speaking to his horse; that she immediately recognized the voice to be that of Thomas Hoag, and upon looking at him, saw the prisoner at the bar, and instantly knew him; that as he passed her he smiled and said, "How d'ye do, cousin?" that the next day he came to her house and asked her how she knew he was the man; witness replied she could tell better if he would let her look at his head; that accordingly she looked and saw a scar upon his forehead, which she had often remarked upon the head of Hoag. Witness added that she was confident prisoner was the person who passed at Rockland as Thomas Hoag.

James Secor testified, that he knew Hoag in Rockland, and had repeatedly seen him there; that Hoag had a remarkable scar on his forehead, and when prisoner was at witness's house, he saw on his head the scar that his wife had described.

Nicholas W. Conklin testified, that he lived in Rockland county; that he knew the prisoner at the bar; that his name was Thomas Hoag; that he could not be mistaken; that Hoag had worked a considerable time for him; that during that time he had eaten at witness's table; that Hoag being a stranger, and witness understanding that he was paying addresses to Catherine Secor, witness took a good deal of notice of him; thought him a clever fellow; saw a great deal of him; lived in a house belonging to witness. When witness saw prisoner at this place, he knew him instantly; his gait, his smile, which is a very peculiar one, his very look was that of Thomas Hoag. Witness endeavored, but in vain, to find some difference in appearance between the prisoner and Hoag; he was satisfied in his mind that he is the same person. Hoag, he thought, was about twenty-eight or thirty years of age; he thought Hoag had a small scar on his neck.

Michael Burke testified, that he saw prisoner several times at Haverstraw, before and after his marriage in December, 1800; that he was as well satisfied as he could be of anything,

that prisoner was the same person he knew in Haverstraw, that about two years ago he met the prisoner in the Bowery, at the time of the Harlem races; prisoner spoke to witness, and said, "Am I not a relation of yours?" Witness replied, "I don't know." Prisoner said, "I am; I married Katy Secor."

Abraham Wendell testified, that he knew one Thomas Hoag in the latter end of the year 1800; he was then in Haverstraw; that he had been very intimate with him, and knew him as well as he knew any man; that he had worked with him, had breakfasted, dined, and supped with him, and many a time had been at frolics with him, and that the prisoner at the bar was the same man; that he had no doubt whatever about it; that witness was as confident prisoner is the person, as he was of his own existence.

Sarah Conklin testified, that she lives in Haverstraw; that in September, 1800, a person calling himself Thomas Hoag was at witness's house, was very intimate there, used to call her aunt; is sure prisoner is the same person; never can believe two persons could look so much alike; would know Hoag from among a hundred people by his voice; Prisoner must be Thomas Hoag; had not seen prisoner since he left Haverstraw till the present day.

Gabriel Conklin testified, that he lived in Haverstraw; that he knew Thomas Hoag; that was at witness's house in September, 1800, and often afterwards; prisoner is the same person, unless there can be two persons so much alike as not to be distinguished from each other; prisoner must be Thomas Hoag; Thomas Hoag had a scar on his forehead and a small scar just above his lip, and prisoner had also these marks.

Judgment.

X. Defense. James Juquar testified that he had known Joseph Parker, the prisoner at the bar, for seven years past; that he had been intimate with him at that time; that they had both worked together as riggers until Parker became a cartman; knew Parker when he lived in Capt. Pelor's house; never knew him absent from the city during this time, for a day, except when he was working on board one of the United States frigates, about a week at Staten Island. In the year 1799, prisoner hurt himself on board the Adams frigate, and then went to his father's in Westchester county and was absent near a month; he was very ill when he left town; witness went with him, and brought him back again, before he was quite recovered; recollects Parker and some other company passing Christmas eve at witness's house the year that Parker lived in Capt. Pelor's house, which was in 1800.

Susannah Wendell testified, that she had known prisoner

for six years past; that he married witness's daughter; knew him when he lived in Capt. Pelor's house. Parker's wife was then ill, and witness had occasion frequently to visit her; saw prisoner there almost daily; Prisoner, excepting the time when he was sick and went to his father's in Westchester, has never been absent from the city more than one week since his marriage with witness's daughter. *Judgment.*

XI. Defense. Here it was agreed between the attorney-general and the counsel for prisoner, that the prisoner should exhibit his foot to the jury, in order that they might see whether there was that scar which had been spoken of in such positive terms by several of the witnesses on the part of the people. Upon exhibiting his foot, not the least mark or scar could be seen on either of them.³ *Judgment.*

XII. Defense. In further confirmation of prisoner's innocence, there was adduced on his behalf one more witness:

Magnus Beekman, who testified, that he was captain of the city watch of the second district; that he was well acquainted with the prisoner, Joseph Parker; that he, Parker, had been for many years a watchman, and had done duty constantly on the watch; that witness recurring to his books, where he keeps a register of the watchmen and of their times of service, found that prisoner, Joseph Parker, was regularly upon duty as a watchman during the months of October, November, and December, 1800, and January and February, 1801, and particularly that he was upon duty the 26th of December, 1800. *Judgment.*

XIII. Verdict. The jury, without retiring from the bar, found a verdict of not guilty. *Judgment.*

In order that you may compare your own judgments with those of persons (or subjects [Ss] as they are technically called) in an actual experiment I shall show you a Table and a Graph which show the distribution of judgments of 50 subjects for every installment.

Since the steps in our scale are probably not equal, we have taken the median value as representing the central tendency, and the quartile deviation on each side of the median as representing the variation.

An analysis in detail of the first experiment by reference to Table I and Fig. 1 will make them easily understandable.⁴ The first vertical column contains the distribution of judg-

TABLE I

THE DISTRIBUTION OF JUDGMENTS IN EXPERIMENT I
Installments of evidence

Scale values	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
9	1	4	11	1				4	8	5			
8	4	12	10	6	2	1		5	12	9			
7	6	15	16	7	5	2		7	11	7	1		
6	22	10	7	11	5	5	7	10	7	2	1	1	1
5	15	9	6	19	21	17	10	20	7	14	16	4	3
4	1			4	10	9	15	2	2	8	2	6	2
3	1			1	4	13	14	1	2	3	12	12	10
2				1	2	2	3	1	1	2	16	20	18
1					1	1	1				2	7	16
M	5.8	6.9	7.3	5.5	4.9	4.5	4.0	5.6	7.0	5.4	3.1	2.4	2.0
Q ¹	5.2	5.9	6.4	4.9	4.1	3.2	3.1	4.9	5.6	4.4	2.2	1.8	1.3
Q ³	6.4	7.8	8.4	6.7	5.5	5.2	5.0	7.0	8.1	7.7	4.8	3.4	2.9

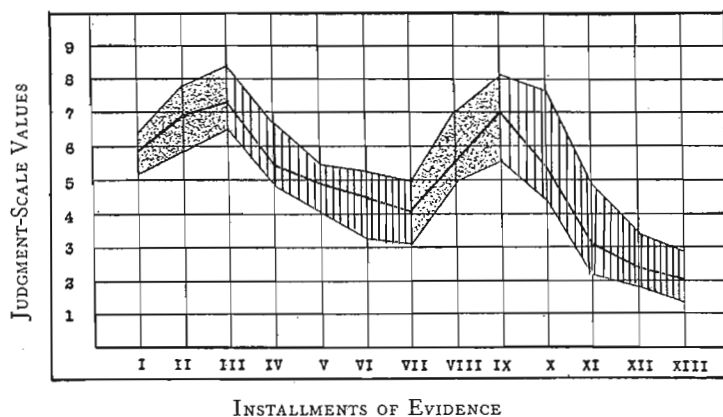


FIG. 1. RELATION BETWEEN JUDGMENTS AND INSTALLMENTS OF TESTIMONY IN EXPERIMENT I

The central black line represents the median value of all the judgments for each installment. The width of the figure represents the quartile deviation above and below the median. The stippled portion shows the effect of the evidence for the prosecution; the barred portion that for the defense.

ments for Installment I (reading of the indictment). One S was convinced of guilt, 4Ss had strong belief in guilt, 6 a fair belief in guilt, 22 a slight belief in guilt, 15 were in doubt,

one had a slight belief and one a fair belief in innocence. The median is 5.9 which means roughly that the group as a whole with an average quartile deviation of 0.60 were led, merely by the indictment, to report a slight feeling of guilt.

The second column gives the distribution of judgments following the testimony of the first witness for the prosecution (a common-pleas judge who had known Thomas Hoag personally, who had married Hoag to Catherine Secor, and who was certain of his identification of the defendant). The distribution has changed significantly. Only 9 Ss, 18%, maintain doubt; all the rest are more or less certain of guilt. The third installment also for the prosecution (the important witness being Catherine Secor, who married Hoag and was sure of her identification) changed the distribution in the direction of certainty of guilt although it had little effect on the median.

The next installment (IV) was the beginning of the testimony for the defense. It consisted in the testimony of Joseph Chadwick (who had known the defendant under the name of Joseph Parker and who testified that the accused had been in his employ in New York City during the time that the witness had known him). The distribution is in the direction of doubt. The next installment (V) carried the median to a point slightly below doubt and the next two installments, VI and VII, still further in the direction of innocence. Here, 14% of the Ss still have a slight belief in innocence; one is certain of innocence.

Installments VIII and IX contain further evidence for the prosecution. The former had more effect upon the change in distribution than any testimony presented up to this time. Two witnesses testified to certain scars and to the existence of a mark on the neck of Thomas Hoag; one of these scars and the mark on the neck were visible on the prisoner. (The

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other scar, said to be visible on the bottom of Hoag's foot, played an important part in the case later on.) One of the witnesses also testified to peculiarities in Hoag's voice which were also found in the prisoner. The general effect of this testimony was to increase belief in the defendant's guilt although 40% of the Ss were in doubt. Installment IX contained testimony that corroborated statements made in Installment VIII, and also statements of witnesses that they recognized Hoag in New York City. Now 40% of the Ss were either convinced or had a strong belief in guilt, and the doubtful cases decreased from 40% to 14%.

Then followed more testimony for the defense. Installment X contained nothing new by way of evidence but had the effect of overcoming the evidence of installment IX and creating greater confusion in the minds of the jurors. The deviation from the median at this point was 1.7 which was the largest variation found in this experiment.

With Installment XI comes the most dramatic incident of the trial. Since a number of witnesses for the prosecution had testified to the presence of a scar on the foot of Thomas Hoag, it was agreed by the attorney-general and the counsel for the prisoner to exhibit the foot to the jury. When this was done no scar or any mark was visible. The effect was remarkable, as 60% of the Ss now have at least a fair belief in the prisoner's innocence; 32% are, however, still doubtful. The final evidence for the defense was that of a witness who from his records showed that Joseph Parker had performed his duty as watchman during the month of December 1800, and particularly on the 26th of December. Now 78% of the Ss have at least a fair belief in his innocence; only 8% are doubtful.

At this point the verdict of the jury in the actual trial was read and judgments were recorded to see whether the decision

of the jury had any effect. The results showed that certainty of innocence was increased.

The fact that the median changes its direction as the evidence changes from prosecution to defense, or vice versa, led us to ask whether the final result might not have been influenced by the order in which the testimony was given. In the second experiment therefore we gave the first three installments as in the first experiment and then followed that with all of the testimony for the defense including installment XI. Then followed the remaining testimony for the prosecution. A glance at Fig. 2 will show that in so far as the first six installments are concerned the result is about the same as in Fig. 1. The continuation of the testimony for the defense, however, carried the judgments down to a median of 2.4 (a fairly strong belief in innocence). The remaining testimony for the prosecution then changed the median judgment to doubt.

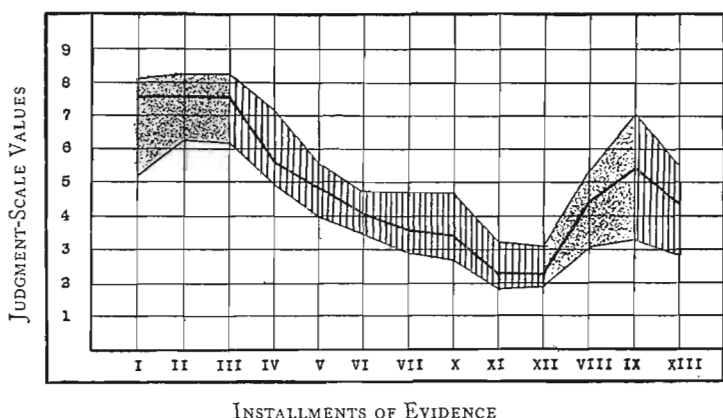


FIG. 2. RESULTS OF EXPERIMENT 2

In a third experiment (Fig. 3) all of the testimony for the prosecution was first given and then all of the testimony for

the defense. The chart shows that at the end of the testimony for the prosecution the median was 7.89, a strong belief in guilt; but as the testimony for the defense accumulated, the median judgment dropped to doubt but with wide variation and then at the end reached a point of 2.3—a strong belief in innocence.

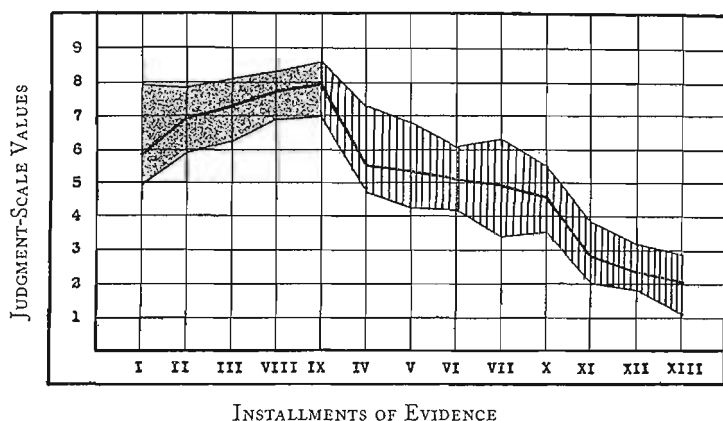


FIG. 3. RESULTS OF EXPERIMENT 3

In experiment 4 all of the testimony for the defense except the showing of the foot to the jury was given first, then all of the testimony for the prosecution, then the foot was shown. When the testimony was given in this order its greatest effect for the defense was a median of 3.33, but installments X and XII, still for the defense, actually raised the median by a small amount. The effect of the testimony for the prosecution was to raise the median to 7.77—a strong belief in guilt. Then with the showing of the foot the median dropped to 3.5—a strong belief in innocence. The slight rise in the upper quartile at installment VII in Fig. 3, and a similar rise in Fig. 4 at installment XII were the result in both cases of two judgments which are contrary to what the evi-

dence would lead us to expect, and which we are unable to explain.

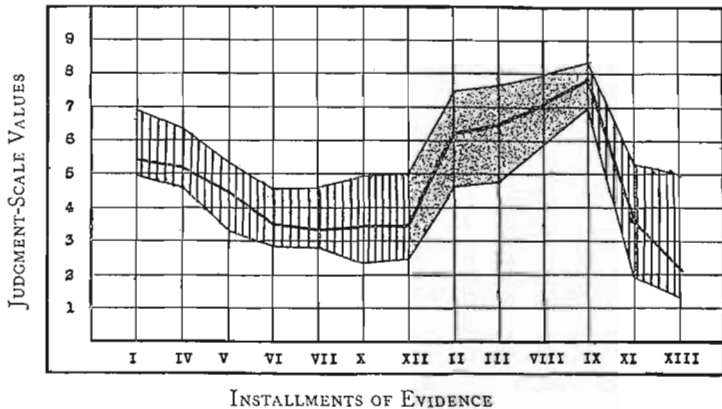


FIG. 4. RESULTS OF EXPERIMENT 4

The general result of the difference in the order in which the testimony was presented was to change the final judgment from a relatively strong belief in innocence (Figs. 1 and 3) to a fair belief in innocence (Fig. 4), or to doubt (Fig. 2).

A study of all of the tables and figures will also show: (1) That the mere indictment created a slight tendency to regard the defendant as guilty. (2) That the direction of the mass tendency as represented by the median is in general a function of the testimony, *i.e.* it tends to rise with the testimony for the prosecution and to fall with that of the defense. (3) That as evidence of a particular kind accumulates the central tendency continues to move in one direction but by relatively smaller steps. In other words there is a law of diminishing returns which, however, may be cut across by a particularly strong bit of testimony. (4) That a particular bit of evidence occurring with other evidence of the same kind is more effective in some orders than in others or, in other words, the

effectiveness of the same testimony depends in part upon its ordinal place. For example, the effect of Installment III in all four experiments is almost exactly the same; namely, a slight rise above II which it always follows; but the effect of Installment II in the first three experiments where it followed the indictment was never more than a single step, whereas in Experiment 4 where it followed six installments for the defense it changed the judgment by three steps. Furthermore, Installment IV was very effective in the first three experiments and had practically no effect in the fourth experiment; Installment XI was least effective near the end of all the testimony for the defense as in Experiments 2 and 3 and most effective after the testimony for the prosecution as in Experiments 1 and 4. In the case of this installment, however, the effect of the testimony was partially enhanced by a change in the testimony from prosecution to defense and was decreased by the limits of the scale, *i.e.*, in Experiment 2 the median of the preceding judgment was 3.43; the judgment of XI could not therefore have differed more than 2.43 steps.

Taking the four experiments together we have a total of 178 Ss who have participated in the experiments, and 2136 judgments. These judgments were not evenly distributed over the nine-point scale. If they had been we should have had 237 judgments or 11% for each point. The actual distribution was as follows; judgment 5 (doubt), 24%; 9 (conviction of guilt), 5%; 1 (conviction of innocence), 2%; all the others ranged from 10%-13%, *i.e.* they approximated closely to the average. The larger proportion of doubtful judgments is, in view of the conflicting nature of the evidence, not surprising. The small proportion at the extremes of the scale reflects the indecisiveness of the testimony and an attitude of caution on the part of many individuals. As regards

the former there was no one bit of evidence which all individuals regarded as incontestable, and consequently many individuals never reached the point of certainty, they could never say "there is no other solution."

Let us turn now to Table II which shows the judgments of 12 different individuals. These are taken from Experiment 4 as representative of the differences among individuals which are found in all of our experiments. The judgments of each of these Ss are represented in the table by the first 12 letters of the alphabet.

A, *J*, and *L* maintain doubt until the beginning of the evidence for the prosecution. *A* and *J*, however, as they afterwards admitted, did not in the beginning follow instructions. No matter what the evidence, they felt that they should maintain the attitude of doubt until all of the evidence was in. Neither was able however to maintain this attitude until the end. *J*, at the beginning of the evidence for the prosecution decided that the case was one of mistaken identity and all subsequent evidence failed to do more than to change his certainty of innocence. *L* was honestly doubtful but with a slight belief in guilt. This feeling was heightened by the evidence for the prosecution until *L* became certain of guilt. For *A* and *J* the absence of the scar on the bottom of the foot led them to the judgment of innocence whereas for *L* it only decreased the certainty of guilt.

B, *D*, *E*, *F*, *G*, *I*, and *K* are all more or less gradually moved toward belief in innocence by the cumulative testimony for the defense. All move toward guilt as the testimony for the prosecution begins, and all except *K* had either a strong or definite belief in the guilt of the prisoner before the foot was shown. *K* was partially convinced of innocence during the last of the evidence for the prosecution because it seemed contradictory.

TABLE II
THE JUDGMENTS OF 12 Ss IN EXPERIMENT 4

Installments of evidence	Subjects											
	A	B	C	D	E	F	G	H	I	J	K	L
I	5	9	8	5	5	5	6	7	7	5	5	5
IV	5	5	8	4	6	5	5	5	7	5	5	6
V	5	4	7	3	4	3	5	7	5	5	4	6
VI	5	3	7	2	2	3	4	4	3	5	3	5
VII	5	3	7	2	2	3	4	3	3	5	3	5
X	5	3	6	4	2	2	3	6	2	5	3	6
XII	5	2	6	4	2	2	3	6	2	4	3	6
II	5	5	8	7	2	3	6	7	5	4	5	7
III	5	7	8	8	3	5	7	8	7	3	5	8
VIII	5	8	8	8	5	7	8	8	7	3	7	9
IX	7	9	8	9	8	8	8	8	8	4	4	9
XI	2	1	6	5	2	5	5	2	4	1	4	7
XIII	1	1	—	5	2	2	1	1	3	1	2	7

C, however, was so convinced of guilt by the indictment alone that in subsequent judgments he never got below 6. All testimony for the defense merely decreased his certainty of guilt. *H* was in many respects similar to *C*. He, however, considered the evidence for the defense as conflicting and this led him to believe that the prisoner might be guilty. This belief was strengthened by the testimony for the prosecution.

A comparison of the horizontal line at judgment IX and the same judgments at installment XI, when the foot was shown to the jury, is instructive. At IX all but two of the 12 Ss were fairly or strongly convinced of guilt. With the showing of the foot, four changed their judgments to innocence, three changed to doubt, two changed to less certainty of guilt, one changed to only slight belief in innocence. It is clear that *B*, *E*, and *H* are easily influenced by their previous judgments, and *D*, *F*, *G*, and *I* are conservative in their judgments moving a step at a time or not at all with successive installments and ending in doubt.

We may summarize the individual differences by saying that the individuals themselves reveal different trends or determinations in their evaluation of the facts. They are four in number and any single individual may have two or more of them at any one time but in different degree. There is first in a few individuals a pre-determination, an attitude of doubt, which is assumed at the beginning and maintained as long as possible; this attitude may be characterized as a rule that one should not reach a judgment until he hears all of the evidence. Secondly, there is a tendency revealed by some Ss to be easily swayed by new evidence. Thirdly, there is a tendency to be cautious, deliberative, to balance a present bit of evidence with other evidence already presented and, in some cases, even to anticipate the possibility of future evidence. Fourthly, there is a determination set up by a preceding judgment; this determination, common in some degree to all individuals, is revealed in two ways. (a) A tendency for all later judgments to be influenced by an earlier one. This is weakest in those who are easily swayed by new evidence, and it is strongest in those who reach so high a degree of conviction in one direction that subsequent evidence which might be expected to move his judgment in the opposite direction has little weight. (b) A tendency for an immediately preceding judgment to influence the next one. That is to say, no single installment, except the first, is judged in an absolute sense, as if it stood alone. Instead, the judgment expressed as a degree on the scale is made relative to the preceding judgment.

There was hardly a testimonial fact that was not judged as most significant by one or more persons. For most individuals, however, the showing of the foot to the jury and the absence of any scar was considered the most significant disclosure in the trial. Some individuals questioned the absence

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of the scar on the ground that it had been at least four years since the scar had been seen by any of the witnesses who reported it, and consequently it might have disappeared. Several Ss were particularly impressed by the testimony that Hoag had scars on his forehead and that the prisoner had these scars. Still others regarded the testimony of the judge (Coe) as most significant not only on the basis of his character as a judge but also because he was certain in his identification. Some thought that Catherine Secor, who had been married to Hoag, could not have been mistaken in her identification; others, however, mistrusted her testimony principally because of her statement that she had, at the time of her marriage, "thought him and still thinks him the handsomest man she ever saw." This was considered as flippant. Some thought that the Haverstraw witnesses as a whole were more reliable, and still others believed the one side as creditable as the other. One observer thought the case of the prosecution was clinched by the testimony that Hoag was identified in New York City after he had left Haverstraw, and another thought the case of the defense was clinched by the testimony that Parker was known continuously throughout the period that Hoag was said to have been in Haverstraw. Several were particularly impressed by the witness who brought his books into the court-room and from them testified that Parker had been on the watch in New York City when Hoag was married in Haverstraw.

We are now in a position to state what happens in the formation of an individual opinion. Under the conditions of our experiment in which earlier formed or accepted opinions have little influence as compared with political or social opinions, the individual is faced with one or more evidentiary facts. These facts are then evaluated. This evaluation is in part governed by the attitudes or determinations which

we have just discussed; and in part by the weight given to a particular bit of testimony. This weight is also influenced by such factors as the character of the witness, the relative probability of the occurrence of the evidentiary fact, and its reasonableness or unreasonableness. Finally, each fact is then evaluated in terms of the prisoner's plea. This is much more immediate than our analysis would lead us to suspect. Under the general determination to form an opinion the testimony is immediately apprehended as strong or weak and as significant to a greater or less degree. There is no evidence of a reasoning process, a drawing of inferences; the judgment is immediate.

Here I must rest my case. There are, however, three things that in conclusion I should like to say. First, to the members of the Bar who may be present. I know perfectly well that important aspects of an actual trial are missing. The preliminary statements of counsel, the personalities of the witnesses, the cross examination, the summing up of counsel, and the charge of the judge are all wanting. In another experiment performed in a moot-court with all the procedure and furnishings of an actual trial, we found that all these factors are effective in the reaching of a verdict. But they influenced the verdict in the same way as did the evidence. We found nothing new as regards the mental processes involved.

Secondly, on behalf of Dean Wigmore I have not the least doubt that his chart method of analysis may be of great value to the young advocate and to counsel in the determination of "proof." Wigmore began by writing a science of evidence which would be complementary to and partly the basis for the Rules for Admissibility which he had dealt with so faithfully in the *Treatise*. Instead of limiting himself to evidence and the part it plays in proof, he was led into the

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psychological facts involved in reaching proof, which was a mistake.

Finally, a word to you my jurors. I fear lest my exposition of the way in which you reached your judgments was too technical and condensed to be illuminating. In particular I fear that my talk of attitudes, tendencies, and the like may have been meaningless to you. Let me add, then, that just as we are creatures of habit in our bodily behavior, so we are creatures of habit in our thinking. Behind these habits are processes which we call tendencies, attitudes, dispositions. We know little of their intimate nature, but we have ample evidence of their existence. We think of them as coördinations and integrations in the nervous system. They are in part, like standing erect or using symbols for communication, common to all men. In greater part they are acquired in the individual's lifetime by learning at teacher's knee, or from the hard jolts of life, or from some salient experience. And because of them we are ready to act or to judge whenever we consider our skill as sufficient or our knowledge as adequate. Consequently, we do not as a rule reach conclusions by hesitating and faltering inferences; on the contrary we jump to conclusions.

HARRY P. WELD

NOTES

¹ This report of the Thomas Hoag case is taken from Wigmore, *The Principles of Judicial Proof*, 1913: 714-720; 1931: 713-719; *The Science of Judicial Proof*, 1937: 888-896. In the interest of brevity a few unessential sentences of the original report are omitted.

² The defense did not contest this marriage.

³ Installment XI is of course neither testimonial nor circumstantial evidence. It is rather immediate, or direct, or real evidence, or again as Wigmore calls it, "Autoptic proference." Since, however, its persuasive value was for the defense we have as a matter of convenience included it in the testimony for the defense.

⁴ The following statement of results has, with the consent of the *American Journal of Psychology*, been taken from an article published in that journal in Vol. LI (1938), 609-629.